Miniaturisation of optically pumped magnetometers

Erling Riis

Strathclyde University, Departmten of Physics, Glasgow, UK

Miniaturisation of optically pumped magnetometers (OPMs) have been made possible through the integration of compact laser sources and detectors with microfabricated MEMS vapour cells. In addition to this physics package development, the adoption of digital control and signal processing techniques has made further simplification possible as well as allowed for the inclusion of additional functionality.

Progress is reviewed on miniaturised and portable OPMs for total field sensing in an unshielded environment demonstrating both high bandwidth and sensitivity and with applications outside a lab environment. Two separate configurations are considered based on the rf-optical double resonance technique and a free-induction decay scheme respectively.